

The Maine Installer

Dedicated to Professionalism in Underground Tank Installation

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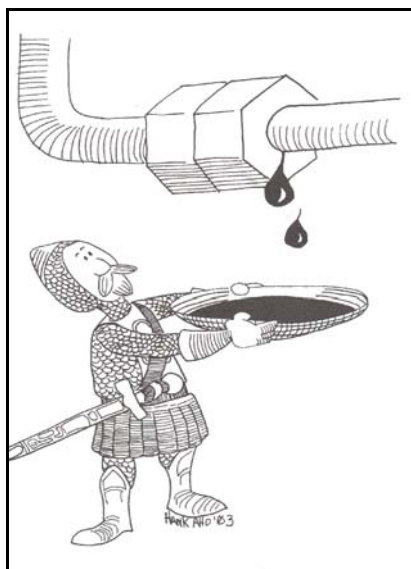
Mending the Armor; Maine's Dispenser and Submersible-Pump Sump Study

The rolling landscape of farms, fields, and forests in rural mid-Maine was once the breadbasket of Boston. Some of the farms remain today, but the crosscut saws and horse teams have been replaced with chainsaws and skidders. And the old squeaky-floor general store with the small lunch counter is quickly being usurped by the modern convenience store, complete with drive-through and pick-up coffee, breakfast, sandwich, and pizza services. One such critter popped up on the landscape in rural Maine smack dab between a couple of homes with private wells. This installation took place a few years prior to Maine's UST siting law, when it was still legal to install gas tanks close to private drinking water wells. (See LUSTLine #38, "There Ought to be a Law.") Less than a year later, the customers didn't have a choice between caffeinated or decaffeinated coffee, because the only thing being served was honest-to-goodness high-test!

During Maine DEP's investigation, the tanks and piping were found tight, and no product was found in the dispenser or tank containment sumps. But after the removal of about 9,000 yards of contaminated soil, we estimated that some 6,000 gallons of super had been released into the ground. The interstitial space of the double-walled flexible piping between the dispensers was full of water and gas, and the hot-test soil reading was under the far super dispenser. We later found that the containment sump under this dispenser had a breach in the sump penetration where a Stage II vapor-recovery line entered the bottom of the sump.

It seemed that gas had leaked from somewhere in the dispenser into and out of the dispenser containment sump and that some of the gas had become

trapped in the double-walled piping between the dispensers. Product never made it to the tank-top piping sump, where it presumably would have been picked up by the leak-detection probe. As it was, the gasoline leaked out quicker than it could be detected. So it took bad coffee to announce that 6,000



gallons of super unleaded was missing.

Well, after a \$1 million plus cleanup, we are still asking the owner for answers on how that much product

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Concerns about Flex Pipe

DEP is writing owners and operators of facilities with thermoplastic flexible piping because DEP staff observed some conditions which concern them. Even though Maine has not experienced any design failures of these systems, we have observed conditions in the field that cause us to have concern. Further, we know of other states that have experienced failure and observed other weaknesses and understand Underwriters' Laboratories (UL) is rewriting its code on this type of piping.

While Maine is not instituting any additional regulatory requirements, we urge installers to closely assess piping systems you inspect at this time and continue to be aware of issues in the piping system. Please ensure that automatic line leak detectors are functioning properly and interstitial space monitors for your piping are operating properly. If your client conducts interstitial space monitoring manually, please remind them to keep a rigorous schedule of such efforts. It is very important that no fuel be allowed to remain in the secondary containment sumps of these systems. In addition to your normal inspection activities, we encourage you to visibly inspect the piping by opening your dispenser cabinets and submersible pump manways. Visible evidence that might indicate the integrity of the piping system is compromised includes:

- The ells, tees, riser pipes and flex connectors found within the sumps where the piping is terminated may be twisted, over stressed or pushed out of normal alignment;
- The pipe may be over bent within the tank sump or it may be folding over on itself (kinked).

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Mending the Armor

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slipped by ... and for financial contributions to the cleanup cause.

Breach in the Armor

Since 1991, Maine has stalwartly relied on secondary containment with continuous leak detection as its sword and shield against leaks from UST's. The breach in our armor was that we did not address dispenser sumps in our rules and that above-ground components of the dispenser could leak and remain uncontained and undetected.

Since the advent of flexible piping some 10 years ago, we have had a *de facto* dispenser containment sump requirement for all flexible piping, as the manufacturers require that all their fittings be housed in containment sumps. As illustrated in the opening story, using dispenser sumps without probes relies on product filling the dispenser sump up to a point where it can flow through the secondary piping back to the tank and then fill the tank sump to a level that trips the leak-detection probe – a kind of Rube Goldberg operation when you think of it!

Not too long ago, we decided it was time to make dispenser sumps with continuous monitoring a part of our UST armor. To provide solid data to support a rule change, we commissioned a study to answer the following questions:

- What level of contamination are we finding under dispensers and around submersible pumps?
- Which dispenser and submersible-pump components are leaking?

There had been two other such efforts elsewhere in the nation to assess the problem. The first was a survey by the Petroleum Equipment Institute (PEI) of 28 members operating in 45 states. (See LUSTline #41, "PEI Members weigh in on UST System Performance.") The second was an EPA-funded study titled *The Frequency and Extent of Dispenser Re-*

leases at Underground Storage Tank Facilities in South Carolina. The PEI survey asked participants what they thought, based on their experience, they would see under dispensers and submersible pumps. The EPA-South Carolina study was based on an analysis of soil samples taken at tank removals.

In our study, Maine DEP hired a consultant to inspect 99 randomly selected active motor-fuel UST facilities throughout the states. The actual inspections were performed from May to November of 2002.

The percentage breakdown of the tank population studied was as follows:

- Retail facilities – 74 percent
- Commercial – 10 percent
- Government – 16 percent

With respect to piping systems, there were 143 pressure dispensers and 110 suction dispensers. Roughly half of these dispensers (124) had containment sumps, compared with 129 that did not. Of the 118 submersible pumps inspected, 99 had containment sumps and 19 did not.

Stains, Weeps, Drips

To quantify the magnitude of releases found during the study, we defined leaks from minor to major as

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Concerns about Flex Pipe

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- The outer jacket of double-walled coaxial piping may be extended over the metallic ferrule of the pipe coupling.
- The outer jacket of double-walled coaxial piping may be splitting as it attempts to grow over the metallic coupling.
- The pipe may be swelling and appear to be bulging or "ballooned."
- The pipe may be wrinkling or it may be sticky/spongy and softer than it was originally.
- The outer walls of the primary pipe and/or the secondary jacket may be cracking.
- The rubber boots that are installed in the walls of the containment sumps may be stretched or torn.
- The donuts that make up part of the boot of some pipe systems may be dislodged or the clamps may not be in place.
- The rubber "test" boots that are installed at the pipe terminations of some coaxial pipe systems may appear to be compressed or distorted.
- The metallic ferrules that are part of some pipe system couplings may be cracked.
- Piping manufactured prior to 1994 that is yellow in color may be delaminated and a fungus microbial growth may be attacking the outer walls of the pipe.

You may view several pictures that illustrate these points at the State of Mississippi Department of Environmental Quality (DEQ) internet web site (www.deq.state.ms.us). From the home page, click on "Underground Storage Tanks" and then "Thermoplastic Flexible Piping Concerns."

If you believe a flex piping system may be experiencing any of the above or you are uncertain, please contact us immediately and we will schedule an inspection of your piping. The inspection is a courtesy and there will not be any determination of regulatory compliance made during the inspection. We simply want to take a proactive position and do what we can to prevent a leak from occurring similar to ones other states have seen.

Please contact David McCaskill or Peter Moulton at 207/287-2651 with any questions or concern you may have related to this matter.

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stains, weeps, or drips. A “stain” was defined as a visible discoloration of a fuel-system component that was not wet to the touch and didn’t cause product paste to turn color when applied. A “weep” was defined as a wet surface that caused product paste to turn color but did not produce any “drips” of product. Finally, a “drip” was defined as an observed droplet of product that would fall and reform when the pump was turned on.

So What Did We Find?

- **What is the level of contamination beneath dispensers?**

Of the 124 dispenser sumps inspected, 72 percent were dry, 19 percent contained water, and 9 percent contained product. Almost all occurrences of liquids in the sumps were minor, with the product or water forming small puddles less than one inch deep. We sampled the soil under 124 dispensers without sumps using the Maine DEP bag head-space photoionization-detection protocol used during site assessments. (We were unable to collect samples under five of the dispensers due to access problems.)

We found that around half of the samples exceeded our existing 100 ppm total petroleum hydrocarbon (tph) level for reporting evidence of a leak, and over a quarter of the readings were over 1,000 ppm! We were left scratching our heads trying to explain why the containment sumps seemed to be so much cleaner than the soil beneath the dispensers without contamination.

- **Which dispenser components are leaking?**

After inspecting 154 suction pumps, 448 filters, 814 meters, 445 unions, and 328 crash valves, we found very few smoking guns. Weeps were observed in 3 to 8 percent of components, and drips were observed in fewer than one percent of components. Staining, however, was observed in 6 to 13 percent of all the components, except for suction pumps, where staining was observed 21 percent of the time.

- **What is the level of contamination around submersible pumps?**

For submersible pumps, 57 percent of the sumps contained water – a few over 20 inches! Only 8 percent of submersible pump sumps contained product, and that was mostly in the form of small puddles in the corners and pockets of the sumps. The soil beneath 63 percent of the submersible pumps without containment sumps had contamination levels above 100 ppm tph; 32 percent had levels over 1,000 ppm.

With regard to the sources of this contamination, an inspection of 51 unions, 107 line-leak detectors, 107 functional elements, 598 pipe joints, and 22 flexible connectors revealed that virtually all were clean. Again, there is this nagging paradox between the dearth of product in the sumps, the dearth of observed leaks, and the prevalence of contaminated soil beneath the submersible pumps.

Why? Why? Why?

With no real leaking guns we have come up with some theories:

- **Dirty dirt?**

During a meeting of tank owners concerning proposed changes to our UST rules, a claim was made that our study was flawed in that it wasn’t limited to sites where there had been no previous tanks. The theory put forward was that we could be seeing contaminated soil left over or returned to the excavation from a tank upgrade. The comment was made by a tank owner who had a site that was included in the study. In this case, the soil cleanup level was 500 ppm because the site was in an urban area served by public water. Soil samples taken under the dispensers during our study were found to be as high as 300 ppm.

So, could the contamination at some of these sites come from dirty dirt left over after the old tanks and piping came out? We looked through the data and found that of the 99 sites, 26 had never had tanks before, while the others had had non-conforming tanks removed and new ones installed.

Of the sites that had no containment sumps and that had never had tanks removed 38 percent had soil contamination above the 100 ppm tph reported level. Of the sites that had no containment sumps, 26 percent had soil contamination above 100 ppm. The data do not support the hypothesis that residual contamination is responsible for the high PID readings.

Furthermore, all of the samples taken during this study were shallow grab samples less than 12 inches deep. In almost all cases, the material sampled was sand or gravel backfill, no native soil. The above-mentioned site had fiberglass-reinforced plastic (FRP) piping, which requires specific backfill that can be assumed to be reasonably clean when installed. For this material to be contaminated by remaining or back-filled underlying contaminated soils, the water table would have to come all the way up to the surface to smear the contamination.

- **Messy Maintenance?**

It is possible that we are just seeing contamination resulting from spills during fuel-filter changes and other maintenance activities in the dispenser area. In fact, that did happen on the very first inspection of the study. Our consultant showed up at a convenience store next to a large shopping-mall parking lot and found more than 2,500 ppm tph in the soil beneath the dispensers. When the manager was informed of the finding, he explained that the Stage II vapor recovery testing contractor had just been there that morning and had to replace clogged fuel filters in order to complete the test.

Changing the filter of an UST fuel system almost always results in spillage. The trick is for the technician to catch as much as possible with spill pans or sorbent material. Changing fuel filters was a common story/reason given for the high levels of dirty dirt found throughout the field inspections. What is interesting about the dispensers with containment sumps is that the majority of the sumps were dry and dusty. Does the presence of containment make

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filter changers more conscientious about spillage? Do sumps facilitate cleaning up the spillage? Or does the product evaporate away without a trace?

- **That Vapor Thing?**

Could the soil contamination result from the migration of product vapors into porous backfill, such as crushed stone? This doesn't sound like a likely story, does it? But a comparison of contaminated soil types found under dispensers without sumps showed that 24 percent of sand, 71 percent of crushed stone, and 81 percent of finer-grain soils had contamination above 100 ppm.

- **Former Leaks?**

Another hypothesis is that all the dirty dirt we saw was the result of former leaks that were fixed. Maine has a mandatory annual UST equipment inspection (for leak detection and spill and overfill equipment). So many drips happen but are caught and fixed sometime during the year before they can cause bigger problems.

Onward with Making the Mend

As you can see, I don't have any nice neat answers this time – only theories, at best. In fact, I would be happy for some input on this one. The complete study will soon be available at the Maine DEP Web site at www.state.me.us/dep/rwm/usts/index.htm.

And since we do have contamination under fuel dispensers (we just don't always know why), we've gone ahead and proposed changes to our UST rules to require dispenser sumps and monitoring under all new motor-fuel dispensers. Based on the contaminated soils found in the study, whether resulting from maintenance activities or the lack thereof, this change seems justified – it's the right thing to do! We may also use these results to incorporate guidelines for inspecting dispensers into our existing annual tank inspection program. What's next with containment sumps? Retrofitting of dispenser sumps at existing facilities? (A tough sell politically.) Routine testing for all

sumps? We'll wait and see what California and the testing manufacturers do on this one. Meanwhile, between tweaking our UST rules and torturing ourselves for not doing more earlier, we continue to soothe our collective being with our mantra: our best armor is our sensitive-area UST siting law, founded on the observation that the only UST that doesn't have a release is the one

that was never built.

W. David McCaskill is an Environmental Engineer with the Maine Department of Environmental Protection. This article is reproduced with permission from LUSTLine Bulletin 44; July 2003. LUSTLine is published by the New England Interstate Water Pollution Control Commission (NEIWPCC).

Composition of the Board of Underground Storage Tank Installers

The Board of Underground Storage Tank Installers (BUSTI) consists of 7 members appointed by the Governor as follows: One from the Department of Environmental Protection, one from either the Maine Oil Dealer's Association or the Maine Petroleum Association; one underground oil storage tank installer; one from the Maine Chamber and Business Alliance or an underground oil storage tank inspector or a second underground oil storage tank installer; one from the Maine Fire Chiefs Association; and 2 public members.

Appointments to the Board are for three-year terms, but no person except the representative from the Department of Environmental Protection may be appointed to serve more than 2 consecutive terms at one time. A member serves until he or she resigns or a successor is appointed. Currently the following members serve the Board:

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Still Trying for a List

In the last issue of The Maine Installer, we asked if any of you wished to be on a list of installers and inspectors currently willing to accept new clients. So far, six (6) firms indicated a desire to be on that list, which we are putting on a new, improved, and reorganized internet web site.

So, if you are accepting new clients, let us know. Contact Jim Hynson at 287-7889 or james.r.hynson@maine.gov, or Theresa Scott at 287-7169 or theresa.j.scott@maine.gov.

Another Test

We recently offered another examination on November 5 at the Pine Tree State Arboretum in Augusta. As a result, two more folks are certified as inspectors: Thomas J. Presnal of Comprehensive Compliance Management, Inc., Gramby, MA and Joseph Bosse of A.L. Doggett, Gray, ME.

Our tests are offered based on demand, So, the more applications that come in, the more frequently the tests are offered.

Underground Tanks Enforcement News

DEP Staff Inspections

So far in calendar year 2003, the Department's Underground Tanks Enforcement staff inspected over 200 facilities for compliance with the Rules for Underground Oil Storage Facilities. DEP inspections serve as a way to make direct contact with UST owners and operators and identify violations that may include but are not limited to operation and maintenance of the UST equipment. A DEP staff inspection does not substitute for a comprehensive annual inspection.

In 2003, inspection priorities included facilities with a high potential for an oil discharge, facilities not previously visited, or facilities that have changed ownership since last inspected by DEP.

At the time of inspection, approximately 68% of all facilities were found to be in substantial operational compliance with the Maine's UST Rules. The other 32% received a Notice of Violation for one or more significant violations of the applicable Rules. The majority of violations involved failure to maintain leak detection equipment or to use a method of leak detection.

Annual Inspections

It is no secret that proper maintenance and operation of an UST facility is the key to preventing oil spills and leaks. This year the Department focused its efforts on getting facilities into compliance with 2001 legislation that requires annual inspections be conducted by certified installers and inspectors, and submitted to DEP.

Since 1991, the Department's Rules have required facility owners to have their leak detection, overfill and spill prevention equipment inspected annually for proper operation by a Certified Tank Installer (CTI) or a person certified by the manufacturer of the equipment being tested. However, now:

- The inspection must be recorded on the DEP form;
- The completed inspection form must be submitted to DEP
- Only a Certified Tank Inspector or Certified Tank Installer may do the inspection.

In May 2003, the Department sent a friendly reminder to over 1,200 facilities that had not yet submitted an annual in-

spection, and shortly afterward, we heard from many installers and inspectors that business was booming. At this time, over 80% of all UST owners have submitted a passing annual inspection for their tanks, although not all of these complied with the July 1, deadline.

Unfortunately, there were still the other 20%. With help offered from the U.S. Environmental Protection Agency, we continue to conduct compliance visits to those sites that did not submit inspections and under Federal jurisdiction to issue DEP Notices of Violation (NOV's) and Federal compliance citations. While the NOV's contain only orders for the facilities to come into compliance, the Federal field citations also have monetary penalties, usually between \$300 and \$500.

In July 2002, the Department advised facility owners that by submitting a passing annual inspection done between July 1 and December 31, 2002 and recorded on the 2003 form, they would be in compliance with both the 2002 annual inspection requirement and the July 1, 2003 deadline. This was a one-time arrangement to enable facility owners to avoid having to do 2002 (old form) and 2003 (new form) inspections in short succession. Some owners and installers have asked whether a "2003" annual inspection done during that period -- on November 1, 2002 for example -- would mean that the facility was in compliance until July 1, 2004. NO! The inspection is an annual requirement, that is, if more than 12 months has gone by since a facility's last passing annual inspection, the facility is operating in violation of the law.

The law also authorizes the Department to issue an administrative order prohibiting delivery of product to, and operation of, any underground tank or tanks that are in violation of this requirement. The Department will likely take this action against facilities that continue to fail to comply with the annual inspection law.

BUSTI Composition

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Alison Smith is Chair and was nominated to the Board on October 18, 2001, and represents the public. Ms Smith resides in Portland and enjoys swimming, reading, gardening and vermicomposting.

Paul Bosse was nominated to the Board on August 16, 2002, and represents the Maine Oil Dealers Association (MODA). Mr. Bosse is President of A.L. Doggett, Inc. in Gray and enjoys hunting, bowling and golf. He also holds a private pilots certificate with an instrument endorsement.

Clifford Buuck was nominated to the Board on August 13, 2002 and represents the Public. Mr. Buuck is the Code Enforcement Officer for the Town of Readfield. He holds a Bachelor of Science degree from the University of Missouri and enjoys outdoor sports, gardening, woodlot management, and antiques.

Kenneth Dixon was nominated to the Board on March 21, 2003 and represents the Fire Chief's Association. Mr. Dixon resides in Andover and is the Fire Chief of the Andover Fire Department. He enjoys snowmobiling, motorcycling, fishing and hunting.

Larry Winchester was nominated to the Board on April 25, 2002 and holds the designated underground tank installer seat. Mr. Winchester resides in Bangor. He enjoys golfing, gardening and working on his home.

George Seel was nominated to the Board on February 17, 2000 and represents the Department of Environmental Protection. Mr. Seel resides in Belgrade and enjoys fishing, hunting, and kayaking.

Legislation in 2002 expanded the pool of individuals available for a seat traditionally held by the Maine Chamber and Business Alliance to also include another certified installer or a certified inspector. For more information on how to apply for this vacancy, please contact me at 207-287-2651 or email at Theresa.J.Scott@maine.gov.

Theresa Scott, Secretary to the Board Of Underground Storage Tank Installers.

The Maine Installer

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Legislature to Review Board of Underground Tank Installers

The State Government Evaluation Act became law in 1995 and established a process for the Legislature to review State agencies. That Act identified the Legislature's Natural Resources Committee as having jurisdiction over the Board of Underground Tank Installers (BUSTI) and that BUSTI was scheduled for review in 2003.

The Act specifies the financial and programmatic review must include, but is not limited to, a review of agency management and organization, program delivery, agency goals and objectives, statutory mandate and fiscal accountability. On April 29, the Natural Resources Committee notified us of the review and requested a "Program Evaluation Report" from us.

We've completed that report and are in the process of submitting it to the Committee. We will place it on the Internet for your review at our earliest opportunity.

While we do not yet know the details, we expect some form of public deliberation by the Natural Resources Committee. If you wish to provide your two cents as to how we are doing, contact either BUSTI staff or the Natural Resources Committee of the Legislature and let your interest be known.

While we can't speak for the Legislative Committee, we'll try to keep you as informed as we are while the process goes forward.



Crowded Mailbox?

Is your mailbox close to overflow from stuff BUSTI and the DEP send you? While sometimes we wish we didn't have to mail so many letters, unfortunately the reality is we've got to keep up the communication.

We thought we could do all of us a favor by sending our information out via email. That would save the State money, and you from at least a little solid waste disposal.

If you are interested in receiving newsletters and mailings via email, let us know by emailing us and thereby letting us know you're interested. You can email either:

- ★ James.R.Hynson@maine.gov, or
- ★ Theresa.J.Scott@maine.gov.

We'll keep track of who's interested, and will begin once there's enough folks to make it worth the effort.